공학석사학위논문

The Influence of Social Presence on MOOC Learners' Performance

MOOC 동영상 시청 시간 동안의 사회적 현존성 제시를 통한 학습자 동기부여에 대한 연구

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Abstract

The Influence of Social Presence on MOOC Learners' Performance

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Collaborative learning has been offered as a realistic solution to decrease isolated feeling of MOOC learners. However, such effort was only applied before or after lecture video session, i.e., discussion board, peer assessment and face-to-face chatting. Therefore, learners who do not join such activities cannot help but staying in the feeling of isolation. Therefore, this study investigate how offering social presence during watching videos influences learners. In particular, this study will focus on social presence of peers, considering the massiveness and openness of MOOCs. In light of the view, through experiment suggesting social presence during watching videos, this

study will try to decrease isolated feeling, and hence encourage educational performance toward the course.

Keywords : Social presence, MOOCs, Online learining

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Index

Figure Index

Table Index

Chatper 1

INTRODUCTION

In 2012, about hundred million dollars were funded for MOOC platforms such as Coursera, edX and other small course offerings [1]. Compared to 2011, user growth rate is greater than 2,000 percent: from 160,000 learners at single university in 2011 to 35,000,000 learners at 570 universities and twelve providers in 2015 [2].

Although the number of MOOC courses and learners has been expanded over several years as such, there are several issues to be studied to improve learning environment on MOOCs. Especially, one of the major issues of MOOCs is a lack of social presence, or feeling of isolation. That is, in spite of thousands of classmates in the same class, learners rarely felt connected with other learners during watching MOOC videos. This phenomenon derives learners to low performance and high rates of attrition. Although collaborative learning or peer learning has been adopted, it is still necessary to be improved. One of the reason is because it only covers students who join collaboration and assignment before and after video sessions.

There are students who do not participate in such group work due to several reasons; they might consider it is waste of time, or

their schedules are not flexible enough to join the works [3]. Moreover, some of students use MOOCs as "books" [2]. That is, learners enrolling in a free course are similar to checking out a book from the public library; they never really finish the entire course "from cover to cover" but pick parts what they want to learn [4]. Under the circumstances, it is necessary to explore different ways to provide learners social presence who are not involved in those collaborative activities.

Therefore, in this paper, social presence will be devised and given during video sessions, and its influence to learners will be analyzed. To measure it, an experiment will be designed and learners will describe and compare the difference in learning experience via survey, retention test, and interview.

Chatper 2

RELATED WORK

In this section, it will be reviewed how social presence has been given in MOOCs so far. For the review and insight from the process, the characteristics of MOOCs compared to Virtual Learning Environments(VLE) will be briefly explained and see what unique characteristics cause specific problem on social presence a solution. With explanation on why and how social presence matters, it will be suggested how current collaborative learning approaches to the issue which has its own limitation.

2.1 SOCIAL PRESENCE

Why social presence is material in MOOc environment could be explained with definition of the term. The concept of social presence was firstly defined as a theory in work by Short, Williams, and Christie. According to the work, social presence was defined as ”the degree of salience of the other person in the interaction and the consequent salience of the interpersonal relationships,” specifying that it depends on ”quality of the medium itself” [5]. As more and more

following studies argued, social presence turned into less about the objective qualities of the medium and more about human perception [6, 7, 8]. Gunawardena and Zittle analyzed which one is the causal determinants of communication differences: the characteristics of the media or users' behavior changed by the users' perceptions of media. They argued that social presence can be cultured among participants of teleconference, and hence, presented that social presence is influenced by both medium and participants of communication.

Considering that interactivity is one of the most important factors in successful learning experiences, it is not strange that the concept of social presence has been defined and applied in the field of education. Community of Inquiry framework, or CoI framework elaborated social presence in learning process into three core presence : teaching presence, social presence, and cognitive presence. Teaching presence is based on three core instructor responsibilities: designing and organizing the course, facilitating discourse, and providing direct instruction. Cognitive presence is "partly dependent upon how communication is restricted or encouraged by [its] medium [8]." Yet, while the effort to adjust the concept of social presence in the educational area should be recognized, the framework is hardly able to be used in the study on MOOCs. This is because it has been developed under the premise of text-based communication; the CoI framework cannot be directly employed to present MOOCs, which has a tons of

learning materials with images and videos.

Teaching immediacy which argued by Wiener and Mehrabian is a measure of the psychological distance that a communicator puts between themselves and the object of their communication [9]. Richardson and Swan identify the concept with a type of social presence without the intermediate variable of media. Hence, they assumed that what cultivates social presence in online courses would be the immediacy behavior of instructors and students in asynchronous communication. From the assumption, they revealed that perception of social presence in online courses has correlation with their perceived learning and satisfaction with their instructors. They believed that this result clearly showed that social presence can be cultured, such as differences in social presence indicate more than media effects and that social presence in online courses can increase students' perceived learning, one of key to actual learning [10].

There are more recent research on online learning and social presence showing the correlation between social presence and educational outcome or affective reaction. Lowenthal(2009) anticipated that increment in social presence increase satisfaction on class [11]. On the contrary, the dearth of social presence in online learning could cause learners to feel isolated and dissatisfied, and increase attrition [12, 13].

Yet, their works did not consider the massive scale of MOOCS

and therefore, they often focused on instructor-student relation; for instance, Richardson and Swan(2003)'s work measure teaching immediacy, a psychological distance between a teacher and learners during class activities. Moreover, such activities were designed for small classes. Discussion and written assignments were mainly arranged and managed by the instructor and staff. Such high dependence on instructors could not be applied to MOOC setting, since there are too much learners to be handled.

2.2 MOOCs

From the aforementioned reviews of related works on social presence, this parts will deeply analyze the features of MOOCs to suggest how social presence should be suggested in MOOC environments. MOOCs, or Massive Open Online Courses, have their own features. It is necessary to understand those unique features in order to address importance of social presence and suggest appropriate forms of it for MOOCs.

When MOOCs should be distinguished from conventional online courses such as Virtual Learning Environments. Although it lacks physical presence of learners and instructors, VLEs, Virtual Learning Environments, still share some features with conventional offline classroom. They usually have small and closed classes compared to

MOOCs; they have strict schedule for a specific group of learners and usually provided by conventional educational institute like universities. Therefore, VLEs are able to rely on management of instructors and staff. VLE learners are described as “captive audience” since they cannot freely choose courses but rather follow a given schedule of conventional educational institutes, such as universities [14].

In contrast, as the abbreviation, Massive Open Online Courses, originally states, the two most significant features of MOOCs would be its openness and massiveness. In terms of openness or open access, MOOC providers are apt to lower accessibility of higher education to the public. [15]. MOOCs only require a computer which lets a learner gain access to internet websites. Along the versatility, free-of-cost services attract fervent learners. With such natures, Moocs have appealed an expanding number of people from all age groups from everywhere [16, 17].

Due to the massive scale, not only from its asynchroneity in interaction between learner-instructor, MOOC learners also suffer from difficulty in interaction with other learners. Many course designer falsely assume that students will enjoy peer learning systems in MOOC classes. Yet, learners are not sure of why or how they should participate in peer learning, though social interaction among peers does ameliorate course performance and completion rate [18]. Therefore, instructors have to design courses reinforcing to participate in and en-

courage students to join peer learning. Yet, as managements of staff are not realistic enough to handle the situation, many learners feel lost or do not take advantage of peer interaction.

Therefore, such nature of MOOC ends up with relying more on students' self-motivation and self-directed learning for successful learning experience compared to VLEs and convetional learning. Zheng et al(2015) consented that MOOC is different in scale, student's level of control and flexibility, the relative roles of instructor and students, student motivation and outcome [14]. According to Milligan, in MOOCs, "there is an expectation that the learners should self-motivate and self-direct their learning [19]."

2.3 COLLABORATIVE LEARNING IN MOOCS

There have been several studies on an individual perception of student-instructor and student-student interaction, or social presence, throughout online learning settings. In particular, due to the huge population of students, interactivity among students were encouraged in order to solve low motivation and high drop-out problem. This is because are the small number of instructors and staff compared to thousands of learners and therefore, it is hard to actively beget interactions among the students and instructors and staff.

In this context, collaborative learning or peer learning has been

offered as one solution to deal with the issue. Such collaborative learning in MOOCs should be led by learners, not instructors. Conventional peer learning techniques intended for classes of a small size, and hence heavily rely on instructors' management to facilitate learners to interaction with each other [18].

Peer assessment lessened staff's work and successfully "encode[d] pedagogy into software, which increases consistency and supports reuse and defaults have a powerful impact on behavior" in the newly emerging massive classes [20]." However, peer learning cannot support diverse types of MOOC learners. There are a cohort that cannot get the advantage; people who has less opportunities for scheduled collaborative work. A previous study showed that while participants felt that peer learning might be helpful, they are reluctant to spend time in coordinating peer activities as well as restricted by the schedule set by these activities [3].

Indeed, such restriction harms openness of MOOCs; people cannot help but follow schedules to taste the benefit, and if they cannot, they would feel isolated even more. Furthermore, even if collaborative learning is applied to video sessions, messaging or co-work activity is not proper.

2.4 RESEARCH QUESTIONS

To sum up, those previous study on social presence in MOOCs has been limited collaborative learning before or after the video sessions. Yet, offering social presence in video-watching step has rarely been explored, which is necessary for learners who have difficulty participating in collaborative learning before and after the step. Under the circumstances, this research will analyze how social presence of peer learners during a video-watching stage influences MOOC learners' learning attitude and learning behavior. Mainly, following two measurements will be evaluated: academic achievement and affective reactions.

Research Question 1. How does social presence during a video-watching stage influence learner's learning behavior?

H1. Learners will feel more social presence when a cue displaying other learners' existence.

H2. Learners will score higher in a retention test under social presence.

Chatper 3

RESEARCH METHODS

To examine the hypothesis and to answer the research question, an experiment was designed as following.

3.1 SOCIAL CUES

How social presence can be given during video sessions were considered carefully. It might hinder learners' attention if a cue of peer students' social presence is offered in the video as the study of Kizilcec et al. [21]. Furthermore, social presence should be provided without too much cognitive load during watching a lecture video. Therefore, a 'social cue' was designed. Social cues are small profile pictures telling the status of each learner by flashing. The cues are automatically and randomly flashed. But participants were told that it flashed when other learners do not focus on the lecture video, while it stays motionless vice versa. This was in order to give authentic feeling of being with others, or social presence.

In this context, 'a status of focus' is defined as a status of lecture-playing internet browser on top or at front. Although true status of

concentration is more complicated, it is impossible to measure without direct observation with or without specific tools. Therefore, instead of such infeasible methods, a status of focus/concentration is defined and measured as aforementioned.

3.2 MATERIALS

3.2.1 COURSE SELECTION

Videos from a single course were utilized in order to unify video properties which can determine engagement between learners and videos, like length, speaking rate, video production style and video type [22]. The lecture video was filmed at Seoul National University for asynchronous distant learning. Among several courses, 'Christianity 101' from department of Religion, college of Humanities was chosen. The video was composed of instructor's presence and PowerPoint slide presentation. Approximately thirty minutes of a video was segmented into four pieces. A half of the video segments were given with social cues, while other half of the video segments were delivered without such social cues (Figure 1, Figure 2). For instance, students in group N watched the first and the third videos with social cues while students in group S saw social cues in the second and the forth video.

그림 1: A lecture with social cues

그림 2: A lecture without social cues

3.2.2 RETENTION TEST

In order to measure educational performance or achievement, a retention test was designed. Each question was coded and therefore it was possible to identify which part of video segment includes knowledge related to the question. Questions were either multiple choices or closed-answer type.

3.3 PARTICIPANTS

Participants (N = 24, 68 percents female, age average = 24) were recruited through various online channels such as university portal sites and Facebook. Before the experiment, all the participants were required to confirm that they had never taken the course ”Christianity 101.” They were asked to fill a demographic survey including age, and gender.In order to exclude possibility of gaps in background knowledge, it was made sure that all the participants had not watched the lecture neither offline nor online.

3.4 EXPERIMENT DESIGN

The whole experiment procedures were mostly conducted by a laptop computer. After each participant was told the sequence of the entire experiment and signed on a consent form, he or she was seated

before a laptop computer. The participant started the experiment with 4-Likert scale survey on their interest and background knowledge on the topic of the lecture. This process was to prevent for gaps on background knowledge of participants influencing depending variables. Then he or she was randomly arranged to one of two sets composed of four segments of lecture videos; one for group N watched the first and the third segments with social cues and the second and the forth without social cues, while one for group S was vice versa. After watching videos, the participant was led to fill a retention test. Following interviews were conducted to look closer how learning experiences were different.

Chatper 4

RESULTS

To answer the first research question, retention test was investigated. The test gave ”don’t know” choice for every question and penalized participants for wrong answers. All the questions from the retention test were coded by whether social cues were given when the related information was presented in the lecture video. Retention test scores were segregated into four parts in order to analyze: the first and the third with social cues(’Video 1, 3 (O)’), the first and the third without social cues(’Video 1, 3 (X)’), the second and the fourth with social cues(’Video 2, 4 (O)’), and the second and the fourth without social cues(’Video 2, 4 (X)’).

Wilcoxon(Mann-Whitney) test was performed to analyze correlation between preferences of social cues and retention test scores. Significant interaction between preferences of social cues and retention test score with social cues was found at five percent level (W = 103.5, p-value = 0.02115). There was no significant difference between preferences of social cues when relevant information to the question was given in the no-social-cue segment (W = 78.5, p-value = 0.454) (Table 1, Figure 3).

Means and standard deviations for each parts are as following (Table 2, Figure 5, 6). There was no correlation between presence of social cues and retention test score. For the first and third video segment, Wilcoxon(Mann-Whitney) test was performed to investigate correlation between test scores when social cues were given and test scores when social cues were not given. According to the test result, there was no significant difference ($W = 99$, p-value = 0.1224). The same process was conducted for the second and the fourth video segment, and there was no significant difference ($W = 71$, p-value = 0.2697) (Table 2, Figure 4, 5).

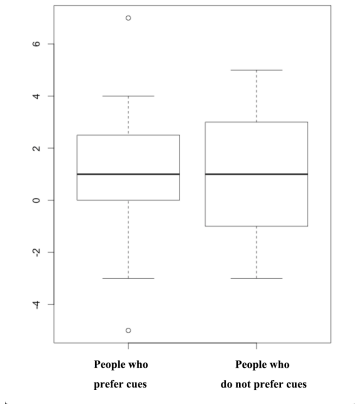

그림 3: A boxplot of the retention test score of people who prefer social cues

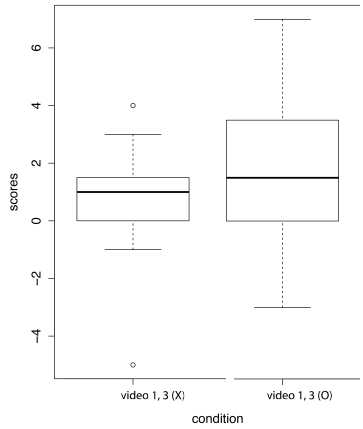

그림 4: A boxplot of the first and the third video segments

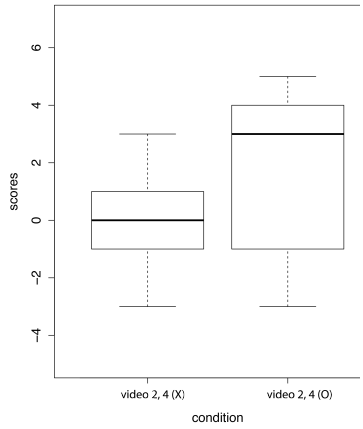

그림 5: A boxplot of the second and the fourth video segments

표 1: Means and standard deviations of the retention test depending on preferences

Test	*mean*	*sd*
Prefer social cues	1.086957	0.826087
Doesn't prefer social cues	2.639769	2.556863

표 2: Means and standard deviations of the retention test under social cue presence

Test	*mean*	*sd*
Video 1, 3 (O)	1.58	2.74
Video 1, 3 (X)	0.54	2.33
Video 2, 4 (O)	1.72	3.06
Video 2, 4 (X)	0.00	1.95

4.1 INTERVIEW

In terms of the first research question, most of participants commented that they felt other learners' presence via social cues, while only two out of twenty-four told they were not influenced by cues at all. One of the two, S07 described oneself as a person with "strong will", and told that he or she is not affected by surroundings at all when studying. S10 said that the size of social cues was too small to capture his or her sight.

Although most of participants, twenty-two participants out of twenty-four participants answered that they were influenced by social cues, their reaction toward social presence during video sessions were diverging. Over ninety-percent of participants answered that social cues were influential.

4.1.1 Overall Pros and Cons of Detecting Others' Presence

First of all, twofold reaction were also found at the answer to the question of which system they prefer: with cues or without cues. Among twenty-four people, a half of people selected the system with cues while the other half chose the system without cues.

A half who preferred the cue often mentioned the advantage of detecting others or "not being alone" for the reason of the choice

(N01, S01, N02, S02, S06, N08, N09, S10). The advantage of ”not being alone” were various. A few told that they could feel homogeneity from people with similar interest or similar behavior (S01, S06).

”I would say it was like playing online game alone. Though I am a solo player, I would not consider myself alone or lonely because of the other players.” (S01)

Some felt that they were actually in the ”real-time” classroom with ”friends” (S01, N02, S02).

While some preferred to be exposed others' social presence, others felt distracted due to the presence (S05, N06, N07, S07, S08, N10, N11, N12). There were basically two types of reasons for their choice. Most of them answered that others' presences themselves are uncomfortable. They tried harder to concentrate on the given materials under cue condition (S05, S08, N07, N11). Some mentioned that flashing effect was annoying (N01, N06, N10).

Form the overall review of participants' reaction toward the social cues, it was noticeable that social presence during video sessions is not always welcomed; therefore, more in-depth analysis on their answers were conducted.

4.1.2 Participants' Reaction toward Negative Cues

All of the participants who answered that social cues were influential said that the cues representing who were not focusing on lecture were more noticeable and powerful to their learning experiences than those representing desirable learning attitudes. Such "negative cues" affect them in two different ways, contributing to twofold preference toward the social presence during the video sessions.

Some students considered negative social cues formed classroom atmosphere conducive to learning.

"I was not really affected by people who concentrated well. I felt competitive and was encouraged by the people who didn't do well. I did not want to be screwed up like them." (S09)

A part of students in this cohort also commented that their acquaintances would be better for themselves to be more competitive and hence more settle down to study (N02, N05, S02).

"Profile photos of friends was more authentic - I felt like I had been actually in the classroom with my friends. Therefore, I was more competitiveness toward 'real people'." (N05)

In contrast, there were a group of people who saw the types of cues irritating.

"I wondered why other students ran out at the very moment I felt excitement. I started to doubt whether I understood the lecture correctly." (N06)

Participants like N06 said that negative social cues discouraged their motivation. Furthermore, when they detected others lost concentration at the very moment they were enjoying the lecture, they felt confused. Due to the confusion caused by the cues, they "doubted if watching the video is waste of time" (N03), "lost interest on lecture" (S02), or even "suddenly felt classroom atmosphere unhelpful to learning" (N11). Furthermore, some of people answered that they did not recognize each social cue as independent person, but they rather considered the entire group as an atmosphere of the whole classroom (S01, S03, S06, S07).

4.1.3 Significance of Sharing Status

Not only detecting others' status but also sharing one's own status to others were powerful motivation to change his or her own learning attitude.

"I would be embarrassed if my distracting attitude could be seen to others, like peers and a instructor. It does not matter whether other people do recognize me from my profile photo or not. I am there, in

every screen of others, and I would feel ashamed." (S02)

"I did not feel to lose my concentration or interest after I found out such flashing signs distracted me. It meant that I could bother others in the same way if I did something irrelevant to the lecture." (S03)

The reason why they do care about sharing their own status were diverse; as aforementioned, one participant considered social cue as representation of oneself and did not want to be ashamed before other students (N02). A few tried to avoid becoming annoyance just like the user behind the flashing social cue annoying him or her at that time (S01, S03). Others answered that sharing status to other would restrict his or her behavior only when he or she took the lecture with friends (S09, N12).

4.1.4 Suggestions on Interfaces

Regardless of pros and cons, there were people who gave insight in how to improve social presence signals.

Firstly, there were people who felt distracted from negative cues not because the meaning of attitude behind the cues but only because the very flashing effect. (N01, N11)

"I did not prefer the flashing effect. The effect itself was so disturbing. (...) I would choose listen to lecture without social cues if social cues keep flashing like that." (N01)

Some participants told that their learning style needs specific setting.

"I am too competitive to concentrate while knowing each single ones' status in online classroom. I would prefer social presence without their status or just a history of the previous and current people who took the lecture." (N03)

"I would recommend filtered social cues; I mean, I would like avoid too much cursory learners. They are too distracting. So if the system can filter out such annoying learners in my sight, it would be the way of taking advantage of the system." (S06)

Chatper 5

DISCUSSIONS

Although educational achievement and affective reaction were not significantly different according to retention test and survey, most of participants answered that they were encouraged or discouraged by social cues during interviews.

5.1 ”SILENT” SOCIAL PRESENCE

Though the social cues did not use any text-based or voice-based messages among users, the ”silent social cues” were successfully deliver social presence. Learners answered that they do feel like with others under the social-cue condition. That is, social cues without text-based or voice-based conversation still work as representations of peer students.

First of all, it was clear that social cues formed an atmosphere of the online classroom. Especially, social cues with negative attitude were more influential than that of positive ones in creating the mood. Participants were much more affected by the cues representing the cursory and unfocused, regardless of whether they liked the cues or

dislike the cues. Such behavior is similar to that of learners in conventional class room; learners are bothered by the undesirable attitude of others.

The ”silent” social cue does not deliver social presence one-way; participants believed that they could express their status to others and become one of the learners creating the mood. The fact that their own status was being shared was a good trigger to make them concentrated. Participants answered that they restricted their behavior and attitude not to bother others or not to be ashamed.

Such results bring the possibility of offering social presence during watching videos with minimum interference. Considering that there are learners who feel isolated and do not participate in collaborative learning before or after video session, silent social presence could be suggested for them.

5.2 NECESSITY OF INDIVIDUAL LEARNING STYLE ANALYSIS

Yet, the results are not directly connected to the conclusion that social cue successfully ameliorate educational performance of MOOC learners. Indeed, there was simply no correlation between presence of social cues and educational performance. Correlation was found between preference on social cues and educational performance. A half

of the participants, who preferred to study with social cues, earned higher scores with social cues. However, the other half who disliked the social cues gained worse scores than the former group with social cues. Considering that two different group had no significant difference in scores without cues, it is obvious that they were not intellectually distinct.

Then it is questionable that how the preference on the system made difference in educational achievement. In light of the view, learners' answers revealed that their choice between a system with social cue and a system without social cue was made along their learning style.

Learning style can be defined as an individual's preferred ways of responding, both in cognitively and behaviorally to learning tasks which change depending on the environment or context [23]. Since learning styles are different from person to person, course designers are required to consider various learning styles.

Considering learning style, it could be assumed that some of learners refuse to be isolated since they wanted to understand the overall atmosphere of the class in their learning process. They could be competitive and motivated by other students, and felt belonged to a group of people sharing the same interest, which made them stable and settled (N01, S01, N02).

In contrast, there were also learners preferred study alone in a

quiet place. They choose to avoid any possible distraction - even other classmates - in order to effectively think and analyze the given contents. For those people, social presence during video sessions might be considered ”extraneous and unnecessary” stimulation (S07). On the other hand, thers could not rely on their own will and therefore they know such cues will catch a glimpse and distract their focus (S10, S11).

Even some students answered that they would like to see only limited information of other learners, such as history of the previous learners, in order to receive optimized stimulation for themselves (N03, S06).

Although it should be confirmed through the experiment built on authentic MOOC environment, the key to understand such diverse reactions might be not only learning style; but also diversity of goals of enrollment; MOOC learners has various learning goals from adopting specific skills to socializing with people sharing the similar interest [14]. Therefore, such factors can differentiate what types of exposure to other learners would most suitable to each learners.

Those reactions could be led to a suggestion: giving students choice, and letting them to turn on and off the social cues.

Therefore, investigation on learning style, when they get higher performance between in the silent place alone, or with peers, would be necessary to understand the result of the experiment and further

analysis. Moreover, correlation between diversity of enrollment goals, learning styles, social presence, and educational achievement should be checked on authentic courses.

5.3 NECESSARY IMPROVEMENT IN INTERFACE

Although there are works on MOOCs which are conducted for very short period, this work still needs to be proved and examined in a more detailed way during a longer period in terms of stimulus design [21]. As interviewees answered, some of learners might need more time to adjust to the system with social cues. That is, some reaction with annoyance on flashing cues might disappear over hours or days (N01, S11). In that case, effect of social presence might be crystal clear since participants are adjusted to such unfamiliar visual effects.

Indeed, additional images might increase cognitive load. Meaningful learning begins when cognitive processing of instructional materials and surroundings are moderate. Not only too little but also too much stimuli are not effective in learning [24]. Clark and Mayer(2016) addressed several principles to reduce cognitive load from multimedia classroom design [25]. According to the study, content should not be gathered in a single channel; stimuli should be distributed from visual channel and auditory channel. Extraneous materials should be

removed for effective processing. As aforementioned answer, to some learners, such flashing effect might be extraneous visual effect that requires time to adjust to.

Furthermore, to explore the correlation between learning style and the proper level of social presence, it is necessary to give various choices to learners: from history of the previous learners only to real-time status sharing (N03).

Chatper 6

CONCLUSION

This study explores how social presence can be designed for video sessions and how it influences learners. Although there have been several studies on assisting MOOC learners suffering from a lack of social presence through collaborative learning, the method which could not cover needs of all learners; some learners only stick to lecture video. In this context, this paper explored if social presence during lecture video session worked as other conventional activity-based social presence. Furthermore, this paper checked whether there was correlation between such social presence and educational performance, and correlation between the social presence and preference on presence of social presence. Answers from interview implied that participants can feel social presence from ”social cues” which does not lead learners to active conversations. Moreover, participants were more affected by unfocused learners, both ending up with being encouraged or vice versa. Last but not least, despite of the aforementioned results, correlation between preference on social presence system and retention test scores implies that further analysis with consideration on learning style and cognitive load is necessary.

참고 문헌

[1] G. Siemens, “Moocs are really a platform,” 2012.

[2] “State of the mooc 2016: A year of massive landscape change for massive open online courses,” Mar 2016.

[3] S. H. Chua, J. Kim, T.-J. K. Monserrat, and S. Zhao, “Understanding learners’ general perception towards learning with mooc classmates: An exploratory study,” in *Proceedings of the Second (2015) ACM Conference on Learning@ Scale*, pp. 305–308, ACM, 2015.

[4] G. Christensen, B. Alcorn, and E. J. Emanuel, “Moocs won’t replace business schools - they’ll diversify them,” Jun 2014.

[5] J. Short, E. Williams, and B. Christie, “The social psychology of telecommunications,” 1976.

[6] C. N. Gunawardena and F. J. Zittle, “Social presence as a predictor of satisfaction within a computer-mediated conferencing environment,” *American journal of distance education*, vol. 11, no. 3, pp. 8–26, 1997.

[7] L. Shih and K. Swan, “Fostering social presence in asynchronous online class discussions,” in *Proceedings of th 2005 conference on Computer support for collaborative learning: learning 2005: the next 10 years!*, pp. 602–606, International Society of the Learning Sciences, 2005.

[8] R. Garrison, “Theoretical challenges for distance education in the 21st century: A shift from structural to transactional issues,”

The International Review of Research in Open and Distributed Learning, vol. 1, no. 1, 2000.

[9] M. Wiener and A. Mehrabian, *Language within language: Immediacy, a channel in verbal communication*. Ardent Media, 1968.

[10] J. Richardson and K. Swan, "Examing social presence in online courses in relation to students' perceived learning and satisfaction," 2003.

[11] P. R. Lowenthal, "The evolution andinfluence of social presence theory on online learning," *Social Computing: Concepts, Methodologies, Tools, and Applications: Concepts, Methodologies, Tools, and Applications*, p. 113, 2009.

[12] T. G. Reio Jr and S. J. Crim, "The emergence of social presence as an overlooked factor in asynchronous online learning.," *Online Submission*, 2006.

[13] G. Cui, B. Lockee, and C. Meng, "Building modern online social presence: A review of social presence theory and its instructional design implications for future trends," *Education and information technologies*, vol. 18, no. 4, pp. 661–685, 2013.

[14] S. Zheng, M. B. Rosson, P. C. Shih, and J. M. Carroll, "Understanding student motivation, behaviors and perceptions in moocs," in *Proceedings of the 18th ACM Conference on Computer Supported Cooperative Work & Social Computing*, pp. 1882–1895, ACM, 2015.

[15] B. Nkuyubwatsi, "Evaluation of massive open online courses (moocs) from the learner's perspective," in *European Confer-*

ence on e-Learning, p. 340, Academic Conferences International Limited, 2013.

[16] S. K. Ch and S. Popuri, "Impact of online education: A study on online learning platforms and edX," in *2013 IEEE International Conference in MOOC, Innovation and Technology in Education (MITE)*, pp. 366–370, IEEE, 2013.

[17] R. He, L. Hui, T. K. Shih, and Y. Chiou, "Peer grading system based on social relations on MOOC," in *2015 8th International Conference on Ubi-Media Computing (UMEDIA)*, pp. 152–157, IEEE, 2015.

[18] Y. Kotturi, C. E. Kulkarni, M. S. Bernstein, and S. Klemmer, "Structure and messaging techniques for online peer learning systems that increase stickiness," in *Proceedings of the Second (2015) ACM Conference on Learning@ Scale*, pp. 31–38, ACM, 2015.

[19] C. Milligan, A. Margaryan, and A. Littlejohn, "Patterns of engagement in massive open online courses," *Journal of Online Learning with Technology (Special Issue on MOOCs)–Under Review*, 2013.

[20] C. Kulkarni, K. P. Wei, H. Le, D. Chia, K. Papadopoulos, J. Cheng, D. Koller, and S. R. Klemmer, "Peer and self assessment in massive online classes," in *Design thinking research*, pp. 131–168, Springer, 2015.

[21] R. F. Kizilcec, K. Papadopoulos, and L. Sritanyaratana, "Showing face in video instruction: effects on information retention, visual attention, and affect," in *Proceedings of the 32nd an-*

nual ACM conference on Human factors in computing systems, pp. 2095–2102, ACM, 2014.

[22] P. J. Guo, J. Kim, and R. Rubin, "How video production affects student engagement: An empirical study of mooc videos," in *Proceedings of the first ACM conference on Learning@ scale conference*, pp. 41–50, ACM, 2014.

[23] E. R. Peterson, S. G. Rayner, and S. J. Armstrong, "Researching the psychology of cognitive style and learning style: Is there really a future?," *Learning and Individual Differences*, vol. 19, no. 4, pp. 518–523, 2009.

[24] R. E. Mayer and R. Moreno, "Nine ways to reduce cognitive load in multimedia learning," *Educational psychologist*, vol. 38, no. 1, pp. 43–52, 2003.

[25] R. C. Clark and R. E. Mayer, *E-learning and the science of instruction: Proven guidelines for consumers and designers of multimedia learning*. John Wiley & Sons, 2016.

초 록

협동 학습(Collaborative learning)은 지금까지의 MOOC에서의 학습자들의 고립감(isolated feeling)을 줄여주기 위해 현실적인 해결책으로써 제시되어왔다. 그러나 이와 같은 노력은 게시판, 화상 채팅, 동료 평가 등 강의시청 후의 고립감을 해결하기 위한 부분에 주로 집중되어 왔다. 이 때문에 강의동영상 시청을 제외한 활동에 참여하지 않거나 참여하기 어려운 학습자들의 경우 협동 학습을 통해 고립감에서 벗어나는 경험의 수혜자가 되기 어렵다. 따라서 본 논문에서는 강의 동영상을 시청하는 동안 강의를 같이 시청하고 있는 다른 학생들의 사회적 현존성(social presence)을 나타내줌으로써 강의 동영상 시청 동안의 고립감을 줄이는 방법을 연구하고자 한다. 특히, 교사와 학생 간이 아닌 학생 간의 사회적 현존성을 제시하는 것에 집중하기로 하였는데, 이는 MOOC의 많은 학생수와 개방성을 고려한 선택이다. 이를 바탕으로, 본 연구에서는 강의 동영상을 시청하는 동안 사회적 현존성을 느낄 수 있는 시스템을 설계해 실험을 통하여 학생들의 고립감을 줄일 수 있는지 확인하고, 나아가 이러한 장치가 교육적인 성취에 영향을 줄 수 있는 지 확인하고자 한다.

주요어 : 사회적 현존성, MOOCs, 온라인 학습

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